

Application No. 10/735,510  
Response to Office Action

Customer No. 01933

Listing of Claims:

1. (Currently Amended) A performance evaluation apparatus comprising:

a reference-performance data supplying unit for successively supplying reference-performance data, ~~the reference-performance data prepared for~~ designating a pitch of a musical sound for generating a sound, a time at which a sound of the musical sound should be generated and a time at which the sound of the musical sound should be ~~vanished~~ terminated;

~~a~~ an actual-performance data supplying unit for successively supplying actual-performance data including a time of instructing ~~to generate~~ actual generation of a sound of a musical sound at the designated pitch and a time of instructing ~~to vanish~~ actual termination of the sound of the musical sound;

a reference on-period extracting unit for extracting a reference on-period indicative of a period between the time at which the sound of the musical sound should be generated and the time at which the sound of the musical sound should be ~~vanished~~ terminated, based on the reference-performance data supplied from the reference-performance data supplying unit;

a real on-period extracting unit for extracting a real on-period indicative of a period between the time of instructing ~~to generate~~ actual generation of the sound of the musical sound

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and the time of instructing ~~to vanish~~ actual termination of the  
sound of the musical sound, based on the actual-performance data  
25 supplied from the actual-performance data supplying unit;

a judging unit for judging whether or not the reference  
on-period extracted by the reference on-period extracting unit  
and the real on-period extracted by the real on-period extracting  
unit overlap with each other ~~or not~~;

30 a comparing unit for ~~compare~~ comparing the pitch of the  
sound generated in the reference on-period extracted by the  
reference on-period extracting unit and the pitch of the sound  
generated in the real on-period extracted by the real on-period  
extracting unit, only when the judging unit determines that the  
35 reference on-period and the real on-period overlap with each  
other; and

an evaluation score calculating unit for adding an  
evaluation point to an evaluation score [[,]] when the comparing  
unit determines that both the pitches are the same, and for  
40 subtracting the evaluation point from the evaluation score [[,]]  
when the comparing unit determines that both the pitches are not  
the same.

2. (Currently Amended) The performance evaluation apparatus  
according to claim 1, wherein the reference-performance data  
supplying unit comprises:

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a performance-data memory for storing a series of data  
5 including on-event data instructing ~~to initiate~~ initiation of  
sound generation of the musical sound at the designated pitch,  
off-event data for instructing ~~to vanish~~ termination of the sound  
of the musical sound, and a time period between the on-event and  
the off-event; and

10 a reading out unit for reading out and supplying event data  
corresponding to the time period from the performance-data  
memory.

3. (Currently Amended) A performance evaluation program for  
causing a computer controlled performance evaluation apparatus to  
execute a procedure comprising:

~~a step of successively supplying reference-performance data~~  
5 ~~, the reference-performance data prepared for designating a pitch~~  
of a musical sound for generating a sound, a time at which a  
sound of the musical sound should be generated and a time at  
which the sound of the musical sound should be ~~vanished~~  
terminated;

10 ~~a step of successively supplying actual-performance data~~  
including a time of instructing ~~to generate~~ actual generation of  
a sound of a musical sound at the designated pitch and a time of  
instructing ~~to vanish~~ actual termination of the sound of the  
musical sound;

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- 15        ~~a step of~~ extracting a reference on-period indicative of a period between the time at which the sound of the musical sound should be generated and the time at which the sound of the musical sound should be ~~vanished~~ terminated, based on the supplied reference-performance data;
- 20        ~~a step of~~ extracting a real on-period indicative of a time period between the time of instructing to ~~generate~~ actual generation of the sound of the musical sound and the time of instructing to ~~vanish~~ actual termination of the sound of the musical sound, based on the supplied actual-performance data;
- 25        ~~a step of~~ judging whether or not the extracted reference on-period and the extracted real on-period overlap with each other ~~or not~~;
- ~~a step of~~ comparing the pitch of the sound generated in the real on-period with the pitch of the sound generated in the reference on-period, only when it is determined that the
- 30        reference on-period and the real on-period overlap with each other; and
- ~~a step of~~ adding an evaluation point to an evaluation score [[,]] when it is determined that both the pitches are the same,
- 35        and subtracting the evaluation point from the evaluation score [[,]] when it is determined that both the pitches are not the same.

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Claims 4-16 (Canceled).

17. (Currently Amended) A performance evaluation apparatus comprising:

a performance designating unit for designating a pitch of a sound-generation event contained in music data and a sound-generation period between a time of initiating sound generation and a time of ~~vanishing~~ terminating the sound generation;

a performance detecting unit for detecting a pitch of a performed musical sound and a time of initiating performance of the musical sound;

a pitch judging unit for judging whether or not the pitch of the performed musical sound detected by the performance detecting unit coincides with the pitch of the sound-generation event designated by the performance designating unit;

a timing judging unit for determining that there is a coincidence in timing [[,]] when one of: (i) the performance detecting unit detects the time of initiating performance within the sound-generation period designated by the performance designating unit, ~~or when~~ and (ii) the performance designating unit designates the time of initiating sound generation within a predetermined time period after the time of initiating performance detected by the performance detecting unit, and for

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determining that there is no coincidence in timing [[,]] when one  
of: (i) the performance detecting unit does not detect the time  
25 of initiating performance within the sound-generation period, or  
when and (ii) the performance designating unit does not designate  
the time of initiating sound generation within the predetermined  
time period after the time of initiating performance detected by  
the performance detecting unit; and  
30 a performance evaluation unit for adding an evaluation point  
to the evaluation score [[,]] when the pitch judging unit  
determines that the pitch of the performed musical sound detected  
by the performance detecting unit coincides with the pitch of the  
sound-generation event designated by the performance designating  
35 unit and when the timing judging unit determines that there is a  
coincidence in timing, and for subtracting the evaluation point  
from the evaluation score [[,]] when the pitch judging unit  
determines that the pitch of the performed musical sound detected  
by the performance detecting unit does not coincide with the  
40 pitch of the sound-generation event designated by the performance  
designating unit or when the timing judging unit determines that  
there is no coincidence in timing.

18. (Currently Amended) The performance evaluation  
apparatus according to claim 17, wherein the timing judging unit  
judges whether or not there is a coincidence in timing for each

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pitch designated by the performance designating unit [[,]] when  
5 the performance designating unit designates plural pitches of  
sound-generation events and plural sound-generation periods.

19. (Currently Amended) The performance evaluation  
apparatus according to claim 17, further comprising:

a time setting unit responsive to a setting operation for  
setting a time period, and

5 wherein the timing judging unit determines that there is a  
coincidence in timing [[,]] when the performance designating unit  
designates the time of initiating sound generation within the  
time period set by the time setting unit.

20. (Currently Amended) A performance evaluation program  
executing for causing a computer controlled performance  
evaluation apparatus to execute a procedure which comprises:

~~a first step of~~ designating a pitch of a sound-generation  
5 event contained in music data and a sound-generation period  
between a time of initiating sound generation and a time of  
~~vanishing terminating~~ the sound generation;

~~a second step of~~ detecting a pitch of a performed musical  
sound and a time of initiating the performance;

10 ~~a third step of~~ judging whether or not the pitch of the  
detected musical sound ~~detected in the second step~~ coincides with

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the designated pitch of the sound-generation event ~~designated in the first step~~;

15        ~~a fourth step of determining that there is a coincidence in~~  
timing  $[[,]]$  when one of: (i) the time of initiating the  
performance is detected ~~in the second step~~ within the designated  
sound-generation period, ~~designated in the first step, or when~~  
and (ii) the time of initiating sound generation is designated in  
20        ~~the first step~~ within a predetermined time period after the time  
of initiating performance is detected ~~in the second step~~, and  
determining that there is no coincidence in timing  $[[,]]$  when one  
of: (i) the time of initiating the performance is not detected in  
~~the second step~~ within the designated sound-generation period,  
~~designated in the first step, or when and (ii)~~ the time of  
25        initiating sound generation is not designated ~~in the first step~~  
within the predetermined time period after the time of initiating  
performance is detected ~~in the second step~~; and

30        ~~a fifth step of adding an evaluation point to the evaluation~~  
score  $[[,]]$  when it is determined ~~in the third step~~ that the  
detected pitch of the performed musical sound ~~detected in the~~  
~~second step~~ coincides with the designated pitch of the  
sound-generation event ~~designated in the first step~~ and when it  
is determined ~~in the forth step~~ that there is a coincidence in  
timing, and subtracting the evaluation point from the evaluation  
35        score  $[[,]]$  when it is determined ~~in the third step~~ that the



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detected pitch of the performed musical sound ~~detected in the~~  
~~second step~~ does not coincide with the designated pitch of the  
sound-generation event ~~designated in the first step~~ or when it is  
determined ~~in the forth step~~ that there is no coincidence in  
40 timing.

21. (New) A performance evaluation apparatus comprising:  
a reference-performance data supplying unit for successively  
supplying reference-performance data designating a pitch of a  
musical sound for generating a sound, a time at which a sound of  
5 the musical sound should be generated and a time at which the  
sound of the musical sound should be terminated;

an actual-performance data supplying unit for successively  
supplying actual-performance data including a time of instructing  
actual generation of a sound of a musical sound at the designated  
10 pitch and a time of instructing actual termination of the sound  
of the musical sound;

a period setting unit for setting an evaluation period in  
accordance with contents of the reference-performance data;

a performance data comparing unit for comparing the  
15 reference-performance data supplied by the reference-performance  
data supplying unit and the actual-performance data supplied by  
the actual-performance data supplying unit within the evaluation  
period set by the period setting unit;

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20 a performance evaluation unit for evaluating a comparison  
result output by the performance data comparison unit; and  
an evaluation outputting unit for displaying an evaluation  
result output by the performance evaluation unit on a display  
device.

22. (New) The performance evaluation apparatus according  
to claim 21, wherein the performance data comparing unit  
comprises:

5 a reference on-period extracting unit for extracting a  
reference on-period indicative of a period between the time at  
which the sound of the musical sound should be generated and the  
time at which the sound of the musical sound should be  
terminated, based on the reference-performance data supplied from  
the reference-performance data supplying unit;

10 a real on-period extracting unit for extracting a real  
on-period indicative of a period between the time of instructing  
actual generation of the sound of the musical sound and the time  
of instructing actual termination of the sound of the musical  
sound, based on the actual-performance data supplied from the  
15 actual-performance data supplying unit;

a judging unit for judging whether or not the reference  
on-period extracted by the reference on-period extracting unit

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and the real on-period extracted by the real on-period extracting unit overlap with each other; and

20       a comparing unit for comparing the pitch of the sound generated in the reference on-period extracted by the reference on-period extracting unit and the pitch of the sound generated in the real on-period extracted by the real on-period extracting unit, only when the judging unit determines that the reference  
25       on-period and the real on-period overlap with each other; and

          wherein the performance evaluation unit adds an evaluation point to an evaluation score when the comparing unit determines that both the pitches are the same, and subtracts the evaluation point from the evaluation score when the comparing unit  
30       determines that both the pitches are not the same.

23. (New) The performance evaluation apparatus according to claim 21, wherein the period setting unit sets the evaluation period in accordance with a number of musical sounds contained in the reference-performance data.

24. (New) The performance evaluation apparatus according to claim 21, wherein the period setting unit sets the evaluation period in accordance with a lapse of a predetermined time period.

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25. (New) The performance evaluation apparatus according to claim 21, wherein the period setting unit sets the evaluation period based on identification data contained in the reference-performance data.

26. (New) The performance evaluation apparatus according to claim 21, wherein the period setting unit sets the evaluation period in accordance with a length of on-period of musical sound contained in the reference-performance data.

27. (New) The performance evaluation apparatus according to claim 21, wherein the period setting unit sets the evaluation period in accordance with a tempo of the reference-performance data.

28. (New) The performance evaluation apparatus according to claim 21, wherein the apparatus further comprises:

an evaluation storing unit for storing the evaluation result with respect to a previous predetermined period evaluated by the performance evaluation unit; and

a judging unit for judging whether a current evaluation result output by the performance evaluation unit is better, the same as or worse than the previous evaluation stored in the

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10 evaluation storing unit, and for providing the judging result to  
the evaluation outputting unit.

29. (New) A performance evaluation program for causing a  
computer controlled performance evaluation apparatus to execute a  
procedure which comprises:

5 successively supplying reference-performance data  
designating a pitch of a musical sound for generating a sound, a  
time at which a sound of the musical sound should be generated  
and a time at which the sound of the musical sound should be  
terminated;

10 successively supplying actual-performance data including a  
time of instructing actual generation of a sound of a musical  
sound at the designated pitch and a time of instructing actual  
termination of the sound of the musical sound;

setting an evaluation period in accordance with contents of  
the reference-performance data;

15 comparing the reference-performance data and the actual-  
performance data within the set evaluation period;  
evaluating a result of the comparison; and  
displaying a result of the evaluation on a display device.